

CLAIMS

1. A chemical vapor deposition method of forming a barium strontium titanate comprising dielectric layer having a varied concentration of barium and strontium within the layer, comprising:

positioning a substrate within a chemical vapor deposition reactor;

providing barium and strontium within the reactor by flowing at least one metal organic precursor to the reactor, and providing titanium within the reactor, and flowing a constant composition oxidizer stream to the reactor, under conditions effective to deposit a barium strontium titanate comprising dielectric layer on the substrate; the barium and strontium being provided within the reactor during all of the deposit of said layer at a substantially constant atomic ratio of barium to strontium; and

during said deposit, changing a rate of flow of the constant composition oxidizer stream to the reactor at least once to effect a change in relative atomic concentration of barium and strontium within the deposited barium strontium titanate comprising dielectric layer.

2. The method of claim 1 comprising changing the rate of flow at least twice.

3. The method of claim 1 comprising providing the barium and strontium within the reactor by flowing at least two metal organic precursors to the reactor, one of the precursors comprising barium, another of the precursors comprising strontium.

4. The method of claim 1 comprising providing the barium and strontium within the reactor by flowing at least two metal organic precursors to the reactor, one of the precursors comprising barium, another of the precursors comprising strontium, the one and the another precursors being fed to the reactor as a mixture in a single flow stream.

5. The method of claim 1 comprising providing the barium and strontium within the reactor during all of the deposit of said layer at substantially constant volumetric flow rates to the reactor.

6. The method of claim 1 wherein the oxidizer is inorganic.

7. The method of claim 1 wherein the oxidizer comprises NO_x , where "x" is at least 1.

8. The method of claim 1 wherein the oxidizer comprises NO.

17. A chemical vapor deposition method of forming a barium strontium titanate comprising dielectric layer having a varied concentration of titanium within the layer, comprising:

positioning a substrate within a chemical vapor deposition reactor; providing barium and strontium within the reactor by flowing at least one metal organic precursor to the reactor, and providing titanium within the reactor, and flowing a constant composition oxidizer stream to the reactor, under conditions effective to deposit a barium strontium titanate comprising dielectric layer on the substrate; the barium and strontium being provided within the reactor during all of the deposit of said layer at a substantially constant atomic ratio of barium to strontium; and

during said deposit, changing a rate of flow of the constant composition oxidizer stream to the reactor at least once to effect a change in atomic concentration of titanium within the deposited barium strontium titanate comprising dielectric layer.

18. The method of claim 17 wherein the changing of a rate of flow of the oxidizer to the reactor at least once is also effective to effect a change in relative atomic concentration of barium and strontium within the deposited barium strontium titanate comprising dielectric layer.

19. The method of claim 17 comprising changing the rate of flow at least twice.

20. The method of claim 17 wherein the oxidizer is inorganic.

21. The method of claim 17 wherein the oxidizer comprises NO_x , where "x" is at least 1.

22. The method of claim 17 wherein the oxidizer comprises NO.

52. A chemical vapor deposition method of forming a barium strontium titanate comprising dielectric layer having a varied concentration of barium and strontium within the layer, comprising:

positioning a substrate within a chemical vapor deposition reactor; providing barium and strontium within the reactor by flowing at least one metal organic precursor to the reactor, and providing titanium within the reactor, and flowing only a single oxidizer to the reactor, under conditions effective to deposit a barium strontium titanate comprising dielectric layer on the substrate; the barium and strontium being provided within the reactor during all of the deposit of said layer at a substantially constant atomic ratio of barium to strontium; and

during said deposit, changing a rate of flow of the single oxidizer to the reactor at least once to effect a change in relative atomic concentration of barium and strontium within the deposited barium strontium titanate comprising dielectric layer.

53. The method of claim 52 comprising changing the rate of flow at least twice.

54. The method of claim 52 comprising providing the barium and strontium within the reactor by flowing at least two metal organic precursors to the reactor, one of the precursors comprising barium, another of the precursors comprising strontium.

55. The method of claim 52 comprising providing the barium and strontium within the reactor by flowing at least two metal organic precursors to the reactor, one of the precursors comprising barium, another of the precursors comprising strontium, the one and the another precursors being fed to the reactor as a mixture in a single flow stream.

56. The method of claim 52 comprising providing the barium and strontium within the reactor during all of the deposit of said layer at substantially constant volumetric flow rates to the reactor.

57. The method of claim 52 wherein the oxidizer is inorganic.

58. The method of claim 52 wherein the oxidizer comprises NO_x , where "x" is at least 1.

59. The method of claim 52 wherein the oxidizer comprises NO.

60. A chemical vapor deposition method of forming a barium strontium titanate comprising dielectric layer having a varied concentration of titanium within the layer, comprising:

positioning a substrate within a chemical vapor deposition reactor; providing barium and strontium within the reactor by flowing at least one metal organic precursor to the reactor, and providing titanium within the reactor, and flowing only a single oxidizer to the reactor, under conditions effective to deposit a barium strontium titanate comprising dielectric layer on the substrate; the barium and strontium being provided within the reactor during all of the deposit of said layer at a substantially constant atomic ratio of barium to strontium; and

during said deposit, changing a rate of flow of the single oxidizer to the reactor at least once to effect a change in atomic concentration of titanium within the deposited barium strontium titanate comprising dielectric layer.

61. The method of claim 60 wherein the changing of a rate of flow of the oxidizer to the reactor at least once is also effective to effect a change in relative atomic concentration of barium and strontium within the deposited barium strontium titanate comprising dielectric layer.

62. The method of claim 60 comprising changing the rate of flow at least twice.

63. The method of claim 60 wherein the oxidizer is inorganic.

64. The method of claim 60 wherein the oxidizer comprises NO_x , where "x" is at least 1.

65. The method of claim 60 wherein the oxidizer comprises NO .

New Claims

Add new claim 66 as follows:

66. (Added) The method of claim 1 wherein the constant composition oxidizer stream comprises multiple oxidizers.